UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 20, 2017

Mr. Daniel G. Stoddard
Senior Vice President and
Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: SURRY POWER STATION, UNIT NOS. 1 AND 2 – RELIEF FROM THE REQUIREMENTS OF THE ASME CODE (CAC NOS. MF8987 AND MF8988; EPID L-2016-LLR-0019)

Dear Mr. Stoddard:

By letter dated December 14, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16355A346), as supplemented by letters dated February 23 and August 31, 2017 (ADAMS Accession Nos. ML17055C360 and ML17251A864, respectively), Virginia Electric and Power Company (the licensee) proposed an alternative to the requirements of the American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (ASME Code), Section XI, IWA-4000. The licensee proposed to apply layers of carbon fiber reinforced polymer to repair the inside surface of buried circulating water (CW) and service water (SW) piping at Surry Power Station (Surry), Units 1 and 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee submitted the proposed alternative for the repair of buried CW and SW piping on the basis that the proposed alternative would provide an acceptable level of quality and safety.

As set forth in the enclosed safety evaluation, the NRC staff concludes that the proposed alternative provides an acceptable level of quality and safety. The NRC further concludes determined that the proposed alternative provides reasonable assurance of structural integrity and leak tightness of the buried CW and SW piping. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes the use of the proposed alternative for the fifth and sixth 10-year inservice inspection interval at Surry, Unit 1, and for the fifth 10-year inservice inspection interval at Surry, Unit 2.

All other requirements in ASME Code, Section XI, for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Enclosure 1 to this letter contains sensitive unclassified non-safeguards information. When separated from Enclosure 1, this document is DECONTROLLED.

The NRC staff has determined that the safety evaluation provided in Enclosure 1 contains proprietary information pursuant to 10 CFR Section 2.390, "Public inspections, exemptions, requests for withholding." Accordingly, the staff has prepared a non-proprietary version, which is provided in Enclosure 2.

If you have any questions, please contact the Project Manager, Karen Cotton Gross at 301-415-1438 or via e-mail at Karen.Cotton@nrc.gov.

Sincerely,

Michael T. Markley

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-280 and 50-281

Enclosures:
1. Safety Evaluation (proprietary)
2. Safety Evaluation (non-proprietary)

cc w/o Enclosure 1: Listserv

ENCLOSURE 2
(NON-PROPRIETARY)

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PROPOSED ALTERNATIVE TO ASME CODE, SECTION XI, REQUIREMENTS FOR

REPAIR/REPLACEMENT OF BURIED CIRCULATING AND SERVICE WATER PIPING

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)

SURRY POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-280 AND 50-281

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PROPOSED ALTERNATIVE TO ASME CODE, SECTION XI, REQUIREMENTS FOR REPAIR/REPLACEMENT OF BURIED CIRCULATING AND SERVICE WATER PIPING

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)

SURRY POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-280 AND 50-281

1.0 INTRODUCTION

By letter dated December 14, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16355A346), as supplemented by letters dated February 23 and August 31, 2017 (ADAMS Accession Nos. ML17055C360 and ML17251A864, respectively), Virginia Electric and Power Company (the licensee) proposed an alternative to the requirements of the American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (ASME Code), Section XI, Article IWA-4000. The licensee proposed to apply layers of carbon fiber reinforced polymer (CFRP) to repair the inside surface of buried circulating water (CW) and service water (SW) piping at Surry Power Station (Surry), Units 1 and 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee submitted the proposed alternative for the repair of buried CW and SW piping on the basis that the proposed alternative would provide an acceptable level of quality and safety.

Portions of the letters dated December 14, 2016, February 23, 2017, and August 31, 2017, contain proprietary information and, accordingly, have been withheld from public disclosure pursuant to 10 CFR 2.390, "Public inspections, exemptions, requests for withholding."

2.0 REGULATORY EVALUATION

Paragraph 10 CFR 50.55a(g)(4) states, in part, that ASME Code Class 1, 2, and 3, components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection (ISI) of Nuclear Power Plant Components."

Paragraph 10 CFR 50.55a(z) states that alternatives to the requirements of paragraphs (b) through (h) of 10 CFR 50.55a or portions thereof may be used when authorized by the Director, Office of Nuclear Reactor Regulation, or Director, Office of New Reactors, as appropriate. A proposed alternative must be submitted and authorized prior to implementation. The licensee must demonstrate that the proposed alternative would provide an acceptable level of quality and safety; or (2) compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Based on the above regulations, the U.S. Nuclear Regulatory Commission (NRC) staff concludes that regulatory authority exists to authorize an alternative to ASME Code, Section XI, as requested by the licensee.

3.0 TECHNICAL EVALUATION

3.1 ASME Code Components Affected

The affected components are ASME Code Class 3 piping, including (a) 96-inch CW system inlet piping from the station intake canal to the main steam condenser, and (b) 24-, 30-, 36-, 42-, and 48-inch SW pipe headers from the CW system to the recirculation spray and supply lines for the component cooling heat exchangers. Enclosure 2 of the licensee's letter dated December 14, 2016, provides the identification number, size, configuration, length, function, and preliminary CFRP installation schedule of the subject piping. Statements and items noted by the licensee are from the submittals dated December 14, 2016, February 23, 2017, and August 31, 2017.

The pipes are encased in concrete and buried underground. The concrete encasement of the pipes is a Seismic Category I structure and provides the seismic support for the piping. The piping was fabricated of carbon steel material conforming to the American Society for Testing and Materials (ASTM) A283, "Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates," Grade B in accordance with the American Water Works Association (AWWA) C201, "Standard Specification for Electric Fusion Welded Steel Water Pipe."

The licensee clarified that inclusion of a small bore branch line (such as one connected to a large bore pipe tee) would involve installation of CFRP to provide the appropriate structural strength from the main pipe line to the small bore pipe penetration transition area.

The proposed alternative does not cover pumps, valves, expansion joints, flange joints, long runs of small bore piping, or threaded connections.

3.2 Applicable Code Edition and Addenda

The applicable Code is the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 2004 Edition, No Addenda, for the fifth 10-year ISI interval at Surry, Units 1 and 2. In its letter dated December 14, 2016, the licensee stated that the Code of record for the Surry, Unit 1, sixth 10-year ISI interval has yet to be determined.

The Construction Code for the subject piping is ASME B31.1-1967, "USAS [USA Standard] Code for Pressure Piping."

In the letter dated August 31, 2017, the licensee confirmed that (1) the CFRP alternative request is to permit the repaired piping to remain in service for the life of the repair, and (2) any repair/replacement and/or inspections of the repaired piping will be conducted in accordance with the applicable edition of ASME Code, Section XI, or alternative thereto, at the time of the repair/replacement or inspection.

3.3 Applicable Code Requirement

In its letter dated December 14, 2016, the licensee stated that the ASME Code requirement applicable to this activity of repairing carbon steel piping is the ASME Code, Section XI, Article IWA-4000, Subarticle IWA-4221(b) that specifies that an item to be used for repair/replacement activities shall meet the Construction Code specified in accordance with (b)(1), (b)(2), or (b)(3). Subarticle IWA-4221(b)(1) specifies that when replacing an existing item, the new item shall meet the Construction Code to which the original item was constructed.

3.4 Reason for Request

In the letter dated December 14, 2016, the licensee stated that the use of a CFRP system to repair the inside surfaces of buried ASME piping is a recent technology improvement that was not available in the 1960s or 1970s to meet the original Construction Code. There are no provisions in the ASME Code, Section XI, or in an approved ASME Code Case for installing CFRP systems as a replacement for carbon steel piping during a repair/replacement activity. Therefore, the licensee submitted the proposed alternative for NRC approval to use the CFRP system for the preemptive repair of the subject piping.

3.5 Proposed Alternative

In lieu of performing repair/replacement activities in accordance with the ASME Code, Section XI, Article IWA-4000, the licensee proposed to use the CFRP system as an alternative pursuant to 10CFR 50.55a(z)(1) for the repair of the CW and SW carbon steel supply lines for Surry, Units 1 and 2.

3.6 Basis for Use

The technical basis for the CFRP system is described below in terms of general requirements, materials specification, testing, design, failure modes and effects analysis, pre-installation evaluation, installation, and examination.

3.6.1 General Requirements

The CFRP system is comprised of layers of high-strength carbon fiber fabrics and glass fiber fabrics, fully saturated in a two-part, 100-percent solids epoxy matrix. These laminates (layers) are bonded both longitudinally and circumferentially to the interior surface of the pipe forming a structural lining inside the pipe. This lining is designed to replace the degraded portions of the existing pipe without reliance on the degraded piping for the life of the repair, except at the terminal ends of the repair.

In its letter dated August 31, 2017, the licensee stated that based on the plant's operating experience, there is no expected mode of degradation in the CW and SW piping to be repaired by the CFRP system other than loss of material due to corrosion.

The quality assurance (QA) and quality control (QC) programs for the CFRP system satisfy 10 CFR 50, Appendix B. As required by 10 CFR 50, Appendix B, Criterion IX, the licensee has established measures to assure that CFRP system activities are controlled and accomplished by qualified personnel using qualified procedures in accordance with the applicable codes, standards, specifications, criteria, and related special requirements. The installers are trained and qualified to assure that suitable proficiency is achieved and maintained. The installation qualification program is designed to provide instruction in the skills required to achieve the critical attributes necessary to assure proper installation in safety-related piping. The licensee's inspectors are qualified based on experience in inspections in similar pipeline applications and special training that they must complete as outlined in Enclosure 7 of the licensee's letter dated December 14, 2016.

3.6.2 Material Specifications

The ingredients of the proposed CFRP system are carbon fiber fabrics, glass fiber fabrics, and epoxy. However, the licensee's proposed alternative also includes the installation of expansion rings at the termination ends of the CFRP system (layers). The specific material specifications are discussed in Enclosure 4 of the licensee's letter dated December 14, 2016.

Epoxy components and fiber material are manufactured as QA Category 1 in accordance with 10 CFR 50 Appendix B and the ASME NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications."

Reinforcing Fabrics

The reinforcing fabrics consist of unidirectional carbon fabrics or bidirectional glass fabrics. The carbon and glass fabric suppliers will maintain a QA and/or QC program in accordance with International Organization for Standardization (ISO) 9001 or Aerospace Standard (AS) 9100, for the verification, validation, monitoring, measurement, inspection, test activities, and criteria for product acceptance. When the raw fiber materials are received by the fabric supplier, they will be accompanied by material Certificates of Conformance. These certificates will be verified by the fabric supplier to meet or exceed required specifications. The licensee stated that conformance to the specifications for each fabric type is verified in-process for every one in ten rolls and at the completion of production.

Epoxy

The licensee stated that the polymeric materials used are a two-part, 100-percent solids epoxy. The epoxy will be compatible with the reinforcing fibers and has the ability to adequately saturate reinforcement fabric. The epoxy will meet specifications for viscosity, working life, high-temperature performance, glass transition temperature, moisture absorption, durability, and mechanical properties. The two-part epoxy (part A and part B) will be manufactured by an ISO 9001 registered company. The epoxy manufacturer will maintain a QA program in accordance with the ISO 9001 standard for the verification, validation, monitoring, measurement, inspection, test activities, and criteria for product acceptance.

3.6.3 Testing

The licensee performs various tests to verify quality of the CFRP ingredients, to confirm proper installation, and to validate the capability of the fabricated CFRP layers as discussed in Enclosure 4 of the licensee's letter dated December 14, 2016. Below are major tests the licensee will perform as part of the proposed alternative.

Quality Control Tests

[[

]]

Installation-Related Tests

The licensee will perform following key tests as part of installation of the CFRP system.

[[

]]

Capability Tests

The licensee performs following key tests to demonstrate the capability of the CFRP system and to verify that the design requirements are satisfied.

[[

]]

3.6.4 Design

The CFRP composite system is designed to have the necessary strength, reliability, and durability as discussed in Enclosure 5 of the licensee's letter dated December 14, 2016. The CFRP layers will carry the design loads even if the host steel pipes continue to degrade to ensure the pipelines continue to fulfill their design function over the design life. The CFRP design will perform as a stand-alone system carrying all design loads without reliance on host pipe materials.

[[

]]

Strength

[[

]]

Reliability

[[

]]

Durability

[[

]]

Design Approach

[[

]]

Design Loads

[[

]]

3.6.5 Failure Modes and Effects Analysis

[[

]]

3.6.6 Pre-Installation Evaluation

[[

]]

3.6.7 Installation

[[

]]

WEKO-SEAL®

As part of the CFRP system, the licensee will also install WEKO-SEAL® at the terminal ends of repaired pipe as discussed in licensee's letter dated December 14, 2016. The licensee stated that WEKO-SEAL® has been used extensively in nuclear facilities to repair large-bore, non-safety related pipes for many years. **[[**

]]

3.6.8 Examinations

Acceptance Examination

[[

]]

Inservice Examination

[[

]]

The licensee will perform system flow testing at least once each ISI interval for the remaining life of the plant in accordance with Surry's System Pressure Test Plans and ASME Code, Section XI, Paragraph IWA-5244(2), which directs that the system pressure test for non-isolable buried components shall consist of a test to confirm that flow during operation is not impaired.

In addition, as stated in Surry Power Station, Units 1 and 2, Updated Final Safety Analysis Report, Section 18.2.17, "Service Water System Inspections," the licensee will inspect components cooled by SW in accordance with GL 89-13 and Supplement 1 to GL 89-13, dated April 4, 1990 (ADAMS Accession No. ML031140185). The GL 89-13 requires a variety of inspections and heat transfer function testing. The licensee will inspect the SW system on a plant refueling outage frequency. The inspections will check for biofouling, damaged coating, and degraded material condition. The licensee will monitor heat transfer parameters for components cooled by SW and visually inspect for loss of material and changes in material properties. The licensee clarified that the CW system is inspected to the same level as the SW system per GL 89-13.

As part of GL 89-13 inspection, the licensee will perform heat transfer testing to identify the aging effects of loss of material and heat transfer degradation. The procedures identify the type and degree of anomalous conditions that are signs of degradation. In the case of SW, degradation includes biofouling and material degradation. The licensee will evaluate whether observed deterioration of material condition is sufficiently extensive to cause loss of intended function for components exposed to the service water.

The licensee noted that Surry inspection procedures will be revised as part of the CFRP design process to include inspection of the installed CFRP material post-installation.

3.7 Duration of Proposed Alternative

The licensee will implement the CFRP repair alternative for Unit 1 during the fifth 10-year ISI interval that began on December 14, 2013, and ends on October 13, 2023, except for a SW line common to Unit 1 and Unit 2.

The licensee will implement the CFRP repair alternative for Unit 2 during the fifth ISI interval that began on May 10, 2014, and ends on May 9, 2024.

The licensee will implement the CFRP repair alternative for the common Unit 1 and Unit 2 SW line during the Unit 1 sixth 10-year ISI interval that begins on October 14, 2023, and ends on October 13, 2033.

The CFRP repair system alternative will remain in place for the life of the plant.

4.0 NRC Staff Evaluation

The NRC staff evaluated the proposed CFRP system in the areas of general requirements, material specifications, testing, design, failure modes and effects analysis, pre-installation evaluation, installation, and examination.

4.1 Summary

The CFRP system is comprised of high strength carbon fiber fabrics and glass fiber fabrics, fully saturated in a two-part 100-percent solids epoxy matrix. These laminates (layers) are bonded both longitudinally and circumferentially to the interior surface of the pipe forming a structural lining inside the pipe. The lining will be designed to replace the degraded portions of the existing pipe without reliance on the degraded piping for the life of the repair, except at the terminal ends of the repair. Based on the above, NRC staff determined that the CFRP system is designed to have the necessary strength, reliability, and durability to support the design loads without considering the host pipe.

The NRC staff notes that operating experience based on nuclear plants, fossil plants and municipal water agencies indicated that most of those CFRP applications have only 5 or 6 years of operating history, however, one nuclear power plant has had CFRP installed since 1997. To date, there has been no reported CFRP degradation. The NRC staff concludes that, based on the operating experience, there is reasonable assurance to expect the CFRP repaired pipes to perform successfully and the licensee's maintenance and inspection programs will confirm acceptable performance during future inspection intervals.

4.2 Material Specifications

As discussed above, the NRC staff notes that the ingredients of the CFRP and GFRP (i.e., epoxy and fabric) are made in accordance with QA and QC requirements of 10 CFR 50 Appendix B; the ASME Code, Section III, NQA-1; and ISO 9000 standards. The requirements of these documents include the verification, validation, monitoring, measurement, inspection, test activities, and criteria for product acceptance. Based on the above, the NRC staff concludes that the proposed CFRP system satisfies the QA and QC requirements of 10 CFR 50, Appendix B and the ASME NQA-1 QA program. As such, the NRC staff further concludes that the licensee has satisfactorily addressed the NRC staff's concerns on the material specifications of the CFRP system.

4.3 Testing

The licensee plans to perform various testing to ensure the integrity of the CFRP and GFRP layers such as testing on material and mechanical properties, quality, and adhesion capability. The NRC staff finds acceptable that the tests are performed based on industry standards such as ASTM or ISO-sponsored test procedures.

[[

]] Therefore, the NRC staff finds acceptable that galvanic corrosion at the terminal ends of the pipe would not likely to occur.

The NRC staff concludes that the licensee has adequately addressed the NRC staff's concern on the long-term durability use of and the embrittlement of the CFRP layers.

4.4 Design

The NRC staff reviewed the licensee's plant-specific stress calculation summaries for all fifteen repairs proposed in the alternative and provided by the licensee. The NRC staff notes that the licensee's calculations have considered the appropriate load combinations in analyzing the repaired pipes that include pipes of 24-, 30-, 36-, 42-, 48-, and 96-inch diameter. **[[**

]]

The NRC staff concludes that the licensee has performed an acceptable Failure Modes and Effects analysis because the licensee has considered significant potential failure modes and demonstrated that the CFRP system is designed to mitigate or prevent the potential failures.

The NRC staff notes that CFRP has been used in aerospace, automotive, marine, and sports industries because of its advantage of high strength combined with low weight.

The NRC staff also notes that AWWA documents are not part of NRC regulations. Further, the NRC staff notes that the proposed ASME code case on CFRP and AWWA C305 are still under development. The NRC staff evaluates the proposed alternative based on the merits of its technical basis in lieu of AWWA guidance or unapproved ASME code case. The NRC staff notes that research results, in and of themselves, do provide reasonable assurance of the performance of the proposed CFRP system.

<u>Factor of Safety (Allowable Stress Design versus Load and Resistance Factor Design)</u>

[[

]]

Results of Effective Factor of Safety for End Use and Their Acceptability

Degraded steel piping (SW and CS systems safety-related Class 3 buried piping sizes at Surry, Units 1 and 2 (24-, 30-, 36-, 42-, 48-, and 96-inch diameter) will be repaired using CFRP composite. The following tables summarize the results of effective factor of safety. [[

]]

The NRC staff's review of licensee's calculations as described above indicates that the CFRP system design provided in the alternative satisfies the acceptance criteria for the applicable limit states. Therefore, the NRC staff finds that there is reasonable assurance that the proposed repair of degraded CW and SW systems using CFRP composite including the terminations overlapping with the host steel piping will maintain structural integrity. The NRC staff concludes that the CFRP design used for the repair of degraded piping at Surry Units 1 and 2 is acceptable.

4.5 Failure Modes and Effects Analysis

The NRC staff concludes that the licensee has performed an adequate failure modes and effects analysis because the licensee has considered potential, credible failure modes of the installed CFRP layers, discussed the basis of why the failure mode is not possible, and provided solutions to either prevent or minimize the failure modes.

4.6 Pre-Installation Evaluation

Based on the information provided in the letter dated December 14, 2017, the NRC staff concludes that the licensee will implement adequate procedures for the pre-installation evaluation of the pipe inside surface to ensure that the inside surface of the host pipe is acceptable for the CFRP installation.

4.7 Installation

The NRC staff notes that licensee will set up hold points during installation to inspect the condition of the CFRP layers as part of the QA and QC program. The hold points will verify equipment calibration, environmental qualities (e.g., monitoring of temperature, air quality, and curing; adhesion, weight ratio, and tensile tests; visual inspections of installation). The NRC staff finds that the hold points are acceptable because this will ensure that any fabrication defects will be identified early and be corrected.

The NRC finds acceptable that the licensee will prepare three mock-ups to develop acceptance standards and to achieve quality installations on the project. A mock-up is prepared for pressure test to confirm watertightness. Mock-ups are prepared with the CFRP layers applied to existing coating to perform adhesion tests to ensure bonding.

The NRC staff finds acceptable that licensee and its vendor will provide training to the installers and inspectors the necessary requirements, including the requirements, criteria related to the knowledge, skills and abilities needed to perform the assigned duties. The installer will be trained by installing actual CFRP system on a mock-up and the inspector will be trained by examining the mock-up with CFRP layers installed.

The NRC staff concludes that the licensee has provided adequate and necessary requirements and procedures for the installation of the CFRP systems.

4.8 Examinations

Acceptance Examination

The NRC staff notes that the proposed alternative did not require an acceptance examination in accordance with the ASME Code, Section III or the Construction Code. The NRC staff further notes that the Construction Code does not have requirements for acceptance examinations of CFRP components. Nevertheless, the licensee proposed that its acceptance examination consists of a final walk down which includes topcoat application and foreign material exclusion (FME) verification. The NRC staff determined that the proposed final walk down and FME verification can be considered acceptance examinations, in part, because they would be expected to identify potential fabrication defects. Based on the licensee's installation procedure, the fabrication defects will be either removed or repaired prior to placing the repaired CW and SW piping into service. Therefore, the NRC staff concludes that the licensee proposed acceptance examinations are acceptable.

Inservice Inspection

The NRC staff notes that the ASME Code, Section XI, IWD-2500 has no examination requirements for the CFRP components. However, the licensee will perform system flow testing at least once each inservice inspection Interval for the remaining life of the plant in accordance with Surry's System Pressure Test Plans and the ASME Code, Section XI, IWA-5244(2). The flow testing will demonstrate the acceptability of flow paths in the subject piping to support the functions of the safety-related relevant systems and components such as recirculation spray heat exchangers and component cooling heat exchangers.

The licensee will also inspect SW and CW piping in accordance with NRC GL 89-13 which requires a variety of inspections and heat transfer testing. The licensee will inspect the SW and CW system on a plant refueling outage frequency. The inspections will check for biofouling, damaged coating, and degraded material condition. The licensee will monitor the material integrity of metallic components, protective coating, concrete, concrete to concrete, concrete to steel joints and WEKO-SEALs®.

The NRC staff finds that the licensee will perform system flow tests in accordance with the ASME Code, Section XI, Paragraph IWA-5244(2). In addition, the licensee will perform inspection in accordance with GL 89-13. The NRC staff concludes that the proposed inservice inspection will ensure structural integrity of the SW and CW system repaired with CFRP system and is, therefore, acceptable.

5.0 CONCLUSION

As set forth above, the NRC staff concludes that the proposed alternative provides an acceptable level of quality and safety. The NRC staff further concludes that the proposed alternative provides reasonable assurance of structural integrity and leak tightness of the buried CW and SW piping. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes the use of the proposed alternative for the fifth and sixth 10-year ISI intervals at the Surry, Unit 1, and for the fifth 10-year ISI interval at Surry, Unit 2.

All other requirements in ASME Code, Section XI, for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributors: John Tsao, NRR/DMLR/MPHP
Chakrapani Basavaraju, NRR/DE/ESEB

Date: December 20, 2017

SUBJECT: SURRY POWER STATION, UNIT NOS. 1 AND 2 – RELIEF FROM THE REQUIREMENTS OF THE ASME CODE (CAC NOS. MF8987 and MF8988; EPID L-2016-LLR-0019) DATED DECEMBER 20, 2017

DISTRIBUTION:
PUBLIC
PM File Copy
RidsACRS_MailCTR Resource
RidsNrrDeEmib resource
RidsNrrDmlrMphb Resource
RidsNrrDorlLpl2-1 Resource
RidsNrrLAJBurkhardt Resource
RidsNrrLAKGoldstein Resource
RidsNrrPMSurry Resource
RidsRgn2MailCenter ResourceJTsao
CBasavaraju

ADAMS Accession Nos.
Proprietary ML17303A037
Nonproprietary ML17303A068 Concurred by SE

OFFICE	NRR/DORL/LPL2-1/PM	NRR/DORL/LPL2-1/LA	NRR/DMLR/MPHB/BC*
NAME	KCotton	KGoldstein (JBurkhardt for)	DAlley
DATE	12/20/2017	11/08/2017	10/20/2017
OFFICE	NRR/DE/EMIB/BC	NRR/DORL/LPL2-1/BC	
NAME	SBailey	MMarkley	
DATE	10/31/2017	12/20/2017	

OFFICIAL RECORD COPY